

REMARKS/ARGUMENTS

In response to the Office Action dated July 30, 2004, claims 1-16 are canceled and new claims 17-32 submitted. Claims 17-32 are now active in this application. No new matter has been added.

OBJECTION TO CLAIMS

Claims 1 and 16 are objected under 37 CFR § 1.75(a). In support of this position, the Examiner identifies language in each claim that is considered to be unclear. By this response, new claims 17 and 32, derived respectfully from claims 1 and 16, do not include confusing and/or vague language. Therefore, it is respectfully urged that the objection be withdrawn.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102 AND § 103

Claims 1, 2, 4 and 6-16 are rejected under 35 U.S.C. § 102(e) as being anticipated by Ricard (USPN 6,731,795).

Claims 3 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ricard in view of Moed et al. (USPN 6,141,433), and presumably further in view of Matsugu et al. (USPN 6,167m167).

The Examiner admits that Ricard does not teach converting an image to a color difference image and detecting an edge that is undetected from a color difference image (claim 3). The Examiner admits also that Ricard does not teach selecting a detected edge as the specific edge when a difference between the background luminance values of two regions (of the received image) each at a prescribed distance in opposite directions from said detected edge is smaller than a prescribed value. The Examiner maintains that Moed et al. does suggest computing a

background intensity value in col. 5, lines 40, 41 that correspond to the claimed background luminance value and “Y different image” that includes a background value in column 4, lines 37-42 that “correspond with the claimed difference of a luminance background that is compared with a threshold” in column 4, lines 49-65 which correspond with the claimed prescribed value. The Examiner then admits that the combination of Ricard and Moed et al. does not teach a background luminance difference smaller than a prescribed value, and refers to Matsugu et al., in the field of image extraction, as teaching a background luminance difference smaller than a prescribed value. The Examiner maintains it would have been obvious to combine the references to meet the terms of the claims.

The rejections of claims 3, 5, 6-10 and 14-16 are respectfully traversed.

With regard to claims 6-10, it is noted that these claims are directed to a causing a computer to execute steps. Ricard fails to disclose a an image process program (recorded on a computer readable recording medium) causing a computer to detect edges using a lightness component and then causing the computer to selected a specific one of the detected edges. All determinations of defects to be removed are done interactively with a user where the user is the final determiner of what is, or is not a defect that is to be removed. Column 9, lines 40-62 of Ricard describes that as an alternative, a machine-executed algorithm for automatically detecting *suspect areas* in images could be used *in conjunction with user input* to identify an elongated area to be repaired. Thus, even when using a machine-executed algorithm, interaction with the user is required for finally determining what is a defect that is to be “filled”/corrected. Thus, the steps of claims 6-10, which are all carried out by a computer, are patentable over Ricard.

Another important difference between the present invention and Moed et al. is that Moed et al. utilizes image information for the current video frame and image information for a

background image; i.e., two separate images. In contrast, claim 3 converts the received image into both a lightness image and a color difference image; i.e., a single image is used to create two separate type images. Claims 8 and 13 similarly require converting the received image (image signal) into both a lightness image and a color difference image. When the edge detecting unit detects an edge in the lightness image, this detected edge will be selected as the specific edge by the selecting unit if it is also undetected as an edge in the color difference image.

In claim 5, the selecting unit selects the detected edge as the specific edge when a difference between the background luminance values of two regions of the received image, each region being at a prescribed distance in opposite directions from the detected edge, is smaller than a prescribed value. Claim 10 has similar limitations, claim 15 is concerned with correcting a lightness component in a portion of the original image detected as a lightness edge when difference in lightness between portions of the original image each at a prescribed distance from the lightness edge on its respective sides is smaller than a prescribed threshold value, so that (after correction) the relevant portion is undetected as the edge in the lightness image, and claim 16 is concerned with correcting a lightness component in a portion of the original image detected as a lightness edge when two portions of the original image each at a prescribed distance from the lightness edge on its respective sides have a same attribute of image so that (after correction) the relevant portion is undetected as the edge in the lightness image. Claim 14 is concerned with correcting the lightness component in a portion of the color original image that is detected as an edge portion in a lightness image that includes the lightness component but is not detected as an edge portion in a color difference image that includes the other component, so that (after correction) the relevant portion is undetected as an edge portion in the lightness image.

Moed et al. does not disclose or suggest correcting the lightness component in a portion of the color original image that is detected as an edge portion in a lightness image that includes the lightness component but which is not detected as an edge portion in a color difference image that includes the other component, so that after correction the relevant portion is undetected as an edge portion in the lightness image (claim 14), the comparison of background luminance values, or lightness, or an attribute of image of two regions (portions) of one received image where the regions are positioned on opposing sides of the detected (lightness) edge and then selecting this edge as the specific edge if each of the compared background luminance values is smaller than a prescribed value, correcting the lightness component in a portion of the original when a difference in lightness between portions of the original image each a prescribed distance from the lightness edge on its respective side is smaller than a prescribed threshold value, so that the relevant portion (after correction) is undetected as the edge in the lightness image (claim 15), or correcting the lightness component in a portion of the original when two portions of the original image each a prescribed distance from the lightness edge on its respective side have a same attribute of image, so that the relevant portion (after correction) is undetected as the edge in the lightness image (claim 16). Thus, claims 3 and 5, as well as 8, 10, 14, 15 and 16 are patentable over Ricard, Moed et al. and Matsugu et al., considered alone or in combination.

At any rate, to expedite prosecution, original claims 1-16 are canceled and new claims 17-32 are submitted. Claims 17-32 are respectively derived from claims 1-16

Thus, new independent claim 17, derived from claim 1, now recites:

17. An image processing apparatus, comprising:
a receiving unit to receive an image of an original image;
an edge detecting unit including a processor to detect edges using a lightness component of said received image, said processor determining whether said edges correspond to folds in the original image;

a selecting unit to select an edge determined by said processor to correspond to a fold in the original image as a specific one of said detected edges; and

a correcting unit to correct the lightness component of said selected specific edge.

New independent claims 22, 27 and 29 are derived similarly from claims 6, 11 and 13.

New independent claim 19, derived from claim 3, now recites:

19. An image processing apparatus, comprising:

a receiving unit to receive an image;

a converting unit to convert said received image into a lightness image including the lightness component and into a color difference image including a color difference component;

an edge detecting unit to detect edges in said lightness image using the lightness component;

a selecting unit to select a specific one of said detected edges, wherein said selecting unit selects as the specific edge an edge that is detected in said lightness image and is also undetected as an edge in said color difference image; and

a correcting unit to correct the lightness component of said selected specific edge.

New independent claim 21, derived from claim 5, now recites:

An image processing apparatus, comprising:

a receiving unit to receive an image;

an edge detecting unit to detect edges in said lightness image using a lightness component of said received image;

a background luminance value calculating unit to calculate background luminance values of said received image; and

a selecting unit to select a specific one of said detected edges, wherein said selecting unit selects a detected edge as the specific edge when the background luminance value of a first region of said received image, at a prescribed distance in a first direction from said detected edge, is substantially equal to the background luminance value of a second region of said received image, at the prescribed distance in a second direction, opposed to the first direction, from said detected edge.

New independent claims 24 and 26 are derived similarly from claims 8 and 10.

New independent claim 30, derived from claim 14, now recites:

30. An image processing apparatus, comprising:

an acquiring unit to acquire an image signal expressing a color original image with three components;

a color space converting unit to perform coordinate transformation of the image signal such that the color original image is expressed by a lightness component primarily representing lightness and by another component; and

a correcting unit to correct the lightness component in a portion of the color original image that (i) is detected as an edge portion in a lightness image that includes the lightness component and (ii) is undetected as an edge portion in a color difference image that includes the other component, so that after correction the relevant portion is undetected as an edge portion in the lightness image.

New independent claim 31, derived from claim 15, now recites:

31. An image processing apparatus, comprising:

an acquiring unit to acquire an image signal indicating an original image;

an edge detecting unit to detect an edge in a lightness image, primarily representing lightness of the original image, as a lightness edge; and

a correcting unit to correct a lightness component in a portion of the original image detected as the lightness edge when a difference in lightness between opposing portions of the original image, each at a prescribed opposing distance from the lightness edge, is smaller than a prescribed threshold value, so that after correction the relevant portion is undetected as an edge in the lightness image.

New independent claim 32, derived from claim 16, now recites:

32. An image processing apparatus, comprising:

an acquiring unit to acquire an image signal indicating an original image;

an edge detecting unit to detect an edge in a lightness image, primarily representing lightness of the original image, as a lightness edge; and

a correcting unit to correct a lightness component in a portion of the original image detected as the lightness edge when two opposing portions of the original image, each at a prescribed opposing distance from the lightness edge, have an attribute of image of said lightness image that is the same, so that after correction the relevant portion is undetected as an edge in the lightness image.

Neither Ricard, Moed et al. nor Matsugu et al., disclose or suggest the features now recited in new claims 17-32. Consequently, the allowance of claims 17-32 is respectfully solicited.

CONCLUSION

Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY



Edward J. Wise
Registration No. 34,523

600 13th Street, NW
Washington, DC 20005-3096
(202) 756-8000 EJW/dmd
DATE: October 28, 2004
Facsimile: (202) 756-8087